A STUDY TO TEST STOCK RETURN BASED ON PE STRATEGY AND THE COMBINATION BETWEEN PE AND 200 DMA STRATEGY IN COMPARISON TO THE RETURN GENERATED BY BUY AND HOLD STRATEGY

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ABSTRACT

The main purpose of this study is to test a market perception that a low Price to Earnings ratio (PE) relatives to 5-year historical average and the combination with 200 Daily Moving Average (DMA), are a good indicator to generate buy & sell signal that can beat buy & hold strategy.
The research uses 28 samples taken from 45 companies in the Kompas 100 index. The first study will use low PE, when company's PE is below its 5-years average PE, the buy signal will be generated. The second study will use combination of low PE and 200 DMA, if PE of company below its 5-years average and its stock price is above 200 DMA, the buy signal will be generated. The T-test analysis will be conducted whether the different return between PE and PEDMA with buy and hold strategy is significant or not.
The results shows that the low PE strategy and the combination of PE and DMA can give positive returns to the investor although it cannot beat the return by using buy & hold strategy. The investor cannot only use low PE as a single indicator in buying or selling stock, there should be another parameters.

Keywords: Price to Earnings Ratio (PE), 200 Daily Moving Average (DMA), Stock prices.

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BACKGROUND

There are some ways to invest money which are investing in business, investing in real estates, saving in the bank and investing in capital market. Investing in capital market especially stocks market has become more popular in this age because it offers an interesting return if it is invested correctly. However, it is not a gamble because unlike gambling that is based on pure luck, in investing people can weigh their decision by analyzing the companies' financial data, the industry condition, price movement, inflation, etc. By doing so, investors could decide whether the price of the stock is worth to buy or not.

Seyhun (2000) found that the PE ratio expresses the relationship between stock prices and the earning per share. Most investors use PE ratio as an indicator of buying or selling decisions. The companies with high growth ratio will have high growth PE ratio. The high growth rate looks attractive for investors, but it can be tricky.

According to Basu (1977), PE ratios are the predictors of future performance. For investors, it is better to buy stock which has Low PE ratio. The companies with high PE ratio can be considered as the overpriced stock. There are some reasons behind it such as a bull market, news about the company, and the industry. On the other hand, Low PE stocks can be considered that the stock is under priced than the actual price.

The price earnings ratio is the fundamental analysis that is used to find out whether the market price is overvalued or undervalued comparing to the value of the company. The author decides to use technical analysis also to help investor make a decision. The investor can know the trend of the stock by looking of moving averages. The author decides to use 200 moving averages becasue the longer period of MA can smooth out the price movement which can confuse the investors. The low PE ratio could be used to select the undervalued however, it is unless there is good buying interest, and cheap stocks can remain cheap for quite long time. Here 200 days moving average will come in handy to helps us to select stocks with the tendency of resuming buying interest.

Investors must analyze the company thoroughly, to know whether the company is fundamentally sound good and whether the stock price represents any value to buy at the moment, before buying the stock. This

could be done by fundamental analysis. However, the price of the stock could go up just because there are the other people who want to pay more for that stock. Technical analysis could help investor to time the entry or exit point.
The data used in this study are the companies from Kompas 100 from the first trading at January 2005 to December 2009 .The time horizon is 5 years. The author benchmark to the 28 companies instead of 100 companies because the rest were go public after 2000 and some data of the companies are not available.

This study aims to test whether low PE Ratio can help investors making buy or sell decisions yielding above Buy and Hold returns and to test whether the combination between low PE ratio and above 200 DMA can give returns yielding above Buy and Hold strategy.

Research Hypothesis

H1: There is a significance difference in return between PE and Buy and Hold strategy

H2: There is a significance difference in return between PEDMA and Buy and Hold strategy

THEORITICAL FOUNDATION

PE ratio is the most well known ratio that is used by investor to value the stock. The PE ratio is calculated by dividing the market price by earning per share of the company. Brigham E. F., (1993) stated that the PE ratio does not give us a full information by itself, it should be compared to the PE ratio to the other company in the same industry, to the market, and the company's historical PE. The author want to explore more how the investor uses PE ratio comparing to the company historical PE.

There is a study done by Benjamin Graham (1934), called value investing. This approach is to buy stocks which is lower than their intrinsic value. Value investing is an approach to find stocks that are selling at a discount prices or the market value is below the intrinsic value. The problem is how do investor know the whether the stocks is sold below the intrinsic value.

Factors affecting stock market

According to Smith (2008), there are some factors that can affect and drive the stock prices :

1. Market condition
   Usually in a bull market, the price of most companies will rise, on the other hand, in a bear market, most company stock prices will go down.
2. The industry condition
   The stock price of the company could go along to the other company's stock prices in same industry. However, there is an exception for some cases, for example, the company will get a benefit if there is bad news related to their competitors.
3. The earning results
   The earning of the company reflects the condition of the company. If the earning reports good earnings, it could create a buying momentum of the company stock in the market.
5. Investment gurus
   Usually the decision of the investment gurus can also drives the stock prices.
6. Insider trading
   If the insider decides to buy or sell their shares, it means there could be a good or bad news about the company.
7. Buy-back
   If the company decides to buy back shares in the market, it means that the amount of the shares available in the market will decrease. Based on the law of demand and supply, if the supply of the stock is decreasing, the price will go up.
8. Interest rates
   If the interest rates is high, many people tend to put their money in the bank instead investing in the stock market. It could cause a bear market as price of the stocks could decline.
9. Demand & Supply
   If there is a tendency of buying trend or increasing demand for the stock, the price of the stock will go up. On the other hand, the stock will go down if there is a selling trend tendency or increasing supply for the stock (Malhotra, 2007)

Price earning ratio

Price earning ratio is firstly introduced as an indicator of company valuation by Graham and Dod in 1934. Now it becomes the most well known ratio for investors to make a valuation according to Loth (1999). The PE ratio is measured by dividing the price per share by earning per share.

"*The price-earnings ratio is part of the everyday vocabulary of investors in the stock market*," said Brealey and Myers in *Principles of Corporate Finance.* Brealey (1996) found that the high PE ratio reflects the investor thought that the firm had good growth opportunitites that make the earnings are relatively safe. Furthermore, Thomas (1994) said in Indianapolis Business Journal, "while accepting that a high PE ratio is usually a sign of high expectations, analysts and brokers nonetheless are quick to caution that the ratios are only part of the puzzle''

The study done by Basu (1977) from 1957 until 1971 shows that the company with low PE ratio gave higher returns compare to the company with high PE ratio. This study contradict with efficient market hypothesis that the price does not impound the information immediately. The study done by Campbell and Schiller (1988) also strengthen the theory by founding that PE ratios have a great prediction power. Furthermore, Jaffe.et.al (1989) also support that the market is not efficient so the existence of PE ratio can be an useful tool to predict the stock returns, they added the evidence that the low PE ratio can give higher returns.

How people use it

According to Bennet (2007), PE ratio cannot tell anything, it should be compared to the other company in the same industry and the historical PE of the company itself. Thus, the investors can make a decision based on the comparison.

There was a study before by Nicholson (1960) analyzing 100 stocks from different industries from 1939 to 1959 and the result was that company with low PE ratio give investors 14.7 times their investment compare to the company with high PE ratio that just give 4.7 times their investment. Based on his study, he concluded that the purchaser of common stocks may logically seek the greater productivity represented by stocks with low rather than high price earnings ratios.

A research that conducted by Fama and French (1992) that used stocks from NYSE, NASDAQ, Amerian Stock Exchange from July 1965 until December 1990, concluded that the stock with low PE ratio tends to outperform the stock with high PE ratio. Another study done by Truong (2009) in New Zealand from 1997 to 2007 also supports the idea that low PE ratio is outperform the high PE ratio. She used companies from different industries which their stocks are traded in New Zealand Stock Exchange.

Why we use 5 years Price earning ratio

The author decides to use 5years PE ratio because the earning in the recent years sometimes does not reflect the true earning power (Beddard, 2009). For example, If you buy a stock based on the particularly good year, you might not get your expected results. Further more, Campbell et al (1988) find that there is too much noise if the investors are just looking for one year interval, but the noise tends to cancel out over the longer time intervals.

Moving averages

If the fundamental analysis is used to find the undervalue stock, the technical analysis is used to determine the trend of the stock. One of the best technical analyses that are commonly used by the investors is the moving average. 200 days moving average is the most popular among the investors. 200 days moving average is the average of the closing price of the stock over past 200 days. The 200 days moving average can help investors to know the market trend whether it is upward or downward.

When the price is above 200 days moving average, it can be intepreted that the trend is upward, hence, the investors should consider to buy the stock. On the other hand if the price is below 200 days moving average, it gives a signal to the investor that the trend is downward, hence, the investors should consider to sell the stocks to avoid losses (200dma, 2006).

A research by Connors from 1989 to 2006 which use S&P500 and NASDAQ stocks have shown that the price above 200 DMA tends to outperform the a stock with below 200 DMA.

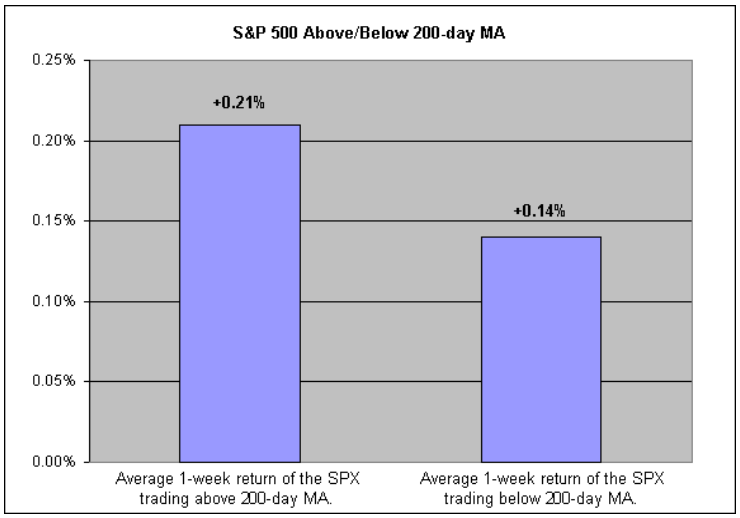

Figure 1. Returns using 200 dma (SPX)

Obtain from
http://www.tradingmarkets.com/.site/stocks/commentary/editorial/200-day-moving-average.cfm

Buy and Hold strategy

Buy and Hold strategy is the long-term investment strategy. The investor selects the stock that looked profitable then buy the stock and hold it for long-term period and in this study is one year period. This strategy will ignore short term noise.

Random Walk Theory

The theory that assumes that the stock price behaves randomly and the future stock trend cannot be predicted based on the past history stock trend (Gray et.al.2004).This also means that as market is efficient and all available information has been reflected in the current stock price, fundamental and technical analysis cannot help to outperform the market.

RESEARCH METHODOLOGY

From the previous chapters, the author has explained the general understranding about the PE ratio and the Day Moving Average indicators that can help the investor to make a buying or selling decision. The PE is

calculated by dividing the price and the earning per share. The information about the earning can be found in the companys' financial statement. Many investor make a buying or selling decision just based on news, instinct, or just following their friend's decision. In fact, there are tools that can help investor to make a buying or selling decision. The tools can be fundamental analyses and technical analyses. This research will focus on the Price earning ratio and Day Moving Average (DMA) to produce the findings that have been conducted previosly by using these two factors. Using the different time and market, the author wants to test the relationship of PE and DMA indicators to the stock market returns.

Research hypothesis and Aim

This study is an explanatory attempting to explain a relationship between two variables in which the changes in one variable can give a different result on another variable. According to Aaler and Day (1990), the explanatory study is used to show that one variable determines the value of other variable. In this case the variables of PE and DMA determines the different level of returns.

Research approach

This study is a quantitative research since the study uses and produces numerical data and transform into quantifiable numbers. The quantitative research is claimed to be associated with the analyses since it can make a comparison and a correlation to get the results.

This study is performed to answer the following questions:

- Do the low PE strategy can give a greater return compare using buy and hold strategy
- Do the combination between low PE strategy and above 200 DMA can give a greater return compare using buy and hold strategy

Time and place

The research is conducted from January 2005 to December 2009. All the information were gathered from the Indonesia Stock Exchange, Bloomberg, Index BEJ, or the official website of the companies. This is a cross-sectional studies since comparing the data at the same point of time.

RESEARCH DESIGN

The purpose of the study

The author decides to combine the low PE ratio and 200 DMA in order to find the undervalue stocks that the trend starts to move upward. The study of low PE ratio has been conducted in several countries such as New Zealand, Greece, thus, the author decides to conduct the research to find out whether the combination of that two theory is applicable in Indonesia or not.

The moving average cannot be the only indicator to buy or to sell because moving average cannot find the undervalue stock. It is used to know the trend of the market, thus, it cannot be the sole comparison of the other strategy.

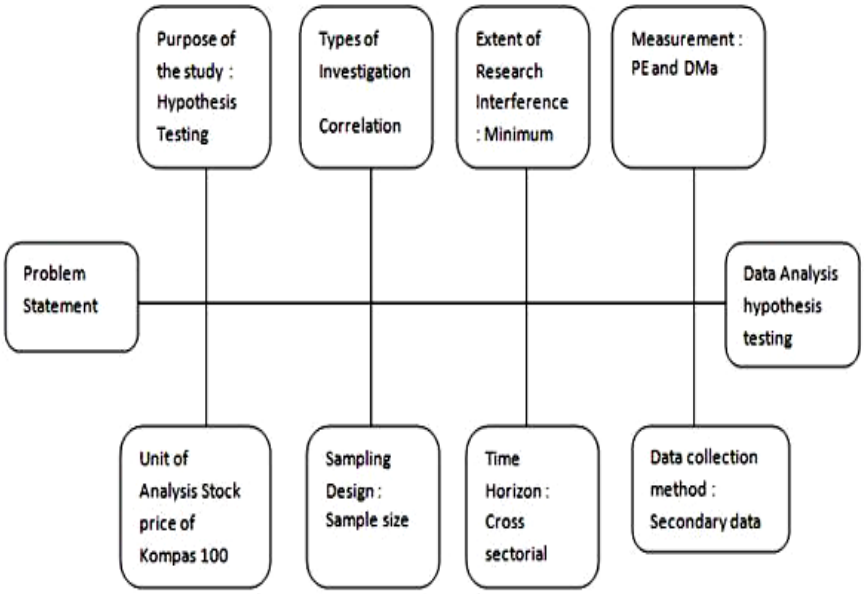

Figure 2. Research Design
Source : Sekaran (2003)

The Type of Data Used in The Research

The data used are taken from the (financial statement of the company and the stock prices that are included in the 28 of 100 liquid companies from

2005 until 2009. The 28 companies are chosen among Kompas 100 due to availability data on the 5 years average PE . Bloomberg is chosen as one of the data source because it provides all the information needed such as market price from 2005 until 2009 and Price Earning ratio.

Method of Gathering Data

The literature reviews are being conducted as part of the preliminary data gathering. To what we can conclude, all the necessary and relevant theories required to enhance the author understanding over the issue will be provided by the literature review. The literature review can be journals, articles, and websites that provides all the information needed for this research.

The secondary data which are gathered from the other resources are collected from Bloomberg, Binus database and the company's website.

Sampling Design

The author decides to use companies from kompas 100 that are listed in the Indonesia stock exchange from year 2005 until 2009. In order to get more accurate results, the author decides to benchmark to the 28 company that have 10 years records of stock prices, earnings. The author will select the stock from the first rank of Kompas 100. However, if the data is not complete, the author will choose the following rank. Kompas 100 is the list of stocks that are listed in BEI which have high liquidity, big capitalization, and good fundamental.

DATA ANALYSES AND INTERPRETATION

Descriptive analyses

The Microsoft Excel will be performed in order to get an answer whether the PE ratio can be an indicator of buying-selling decision. First, the author collect the market price of the sample company from 2005 until 2009, then to calculate the price earnings ratio, the author needs to get the trailing EPS. In order to find the low PE ratio, the investor need to compare the ratio to the historical PE or competitor within the same industry, in this study, the author decides to compare the PE ratio to its 5 years historical PE. If the PE is below the 5 years historical PE, it is an indicator of buying decision because it means that the stock is

underpriced, on the other hand, if the price is over the 5 years historical PE, it can be interpreted that that stock is overpriced which mean the time of selling decision.

There is another method that the author tries to compare. It is using the combination of low PE and 200 DMA. The 200 DMA is the average of 200 previous days market price. The DMA is used to know the momentum trend of the market. If PE is below 5 years average PE and the stock price is above 200DMA, it signals a buy decision. If PE is above its 5 years average PE or the stock price is below its 200 DMA, it signals a sell decision.

The reason why the sell signal just need to fulfill one condition are:

-If the PE is above 5 years PE, it means that the stock price is not cheap anymore so it does not need to wait for the other condition

-On the other hand, if the price is below 200 DMA, the upside momentum may have ended so we do not want to own the stock anymore.

In this study, lets assume that the investor allocates Rp. 10 million to invest in any single stock. If there is a buy signal of PE strategy, the investor will buy the stock that worth Rp. 10 millions. Then, the investor get some number of shares that worth 10 million. If there is a sell signal, the investor will sell all shares that he has. At the end of the year, we will calculate the percentage return from that Rp. 10 million investment. We do this simulation for each company. At the end of the year, we will calculate the average return from the 28 companies. There is some case that there is still no sell signal in that year, in order to compare with 1 year holding period, although there is no sell signal until the end of the year, the stock should be sold in the end of the year and buy it again with the price at the beginning of the next year.

For example, BLTA, in 2005, there was a buy signal when the price at Rp589, then the investor bought stocks at that price that worth 10 millions, so the investor got 16,977 shares. After that, there was a sell signal at Rp659, so the investor should sell all the shares at that prices, and would get the revenue for Rp 11,188,455. Then, there was a buy signal again at Rp745, the investor bought the shares at that price with Rp11,188,455 , and would get 15,018 shares. There was a sell signal again at Rp893, the investor sold all his stocks at that price and would get Rp13,411,128. There was a last buy signal in that year at Rp901, so the investor bought the shares at that price with Rp13,411,128 revenue. The investor got

14,844 shares. In that year, there is no sell signal anymore, so to compare with Buy & Hold 1 year holding period, the stocks should be sold at the end of that year with the price at 901, so the investors will get Rp13,411,128. Then, to get the percentage return for that year, the last revenue which is Rp13,411,128 would be reduced with the initial capital which is Rp10,000,000 and will be divided by Rp10,000,000. Therefore, the PE strategy would result in 34% return in that year.

After finding the return for all 28 companies, the return would be averaged by adding all the returns of 28 companies then divided by 28 companies. So there would be 5 years returns for all 3 strategies. Furthermore, to find the overall returns, the returns from 2005-2009 will be summed up than divided by 5 years. So there will be 3 average returns for 3 strategis of 28 companies.

Paired-samples T - test

Paired–Samples T test is using to compare the mean from two samples. From the result, the author will get the P value that is used to know whether to reject or accept the hypothesis and whether the difference is significant or not.

FINDINGS AND DISCUSSIONS

In this research, the author decides to take 28 companies out of 100 companies from the kompas 100 as samples. Bloomberg shows that only 28 companies have the necessary data that we need. The time horizon is 5 years from 2005 to 2009.

Descriptive Analyses

In 2005, the PE strategy yielded 18,02 % while the Buy and Hold strategy's return gave a lower return of 13,70%. In 2006, the PE strategy resulted in 23,23% return which an increase from year 2005, but with Buy and Hold strategy, the investor can get 70,05% return for holding 28 stocks in that year. In 2007, although the PE strategy can give a nice return of 40,21%, but the Buy and Hold strategy even gave larger return of 71,81%. In 2008, when the crisis struck worldwide, the price of stocks went down sharply causing Buy and Hold strategy a negative return of -

49,24% to the investor. However, using low PE strategy, the impact of the crisis can be somewhat minimized resulting in a negative return of -23,60% to the investors. In 2009, Indonesia economy gradually recovered from the crisis and Buy and Hold strategy came back to be the winner after giving 113,43% return compare to the PE strategy that only gave 43,84% return.

Table 1. The time horizon is 5 years from 2005 to 2009

Year	Average returns using PE strategy	Average returns using PEDMA strategy	Average Return using Buy and Hold strategy
2005	18,02 %	7,56%	13,70%
2006	23,23%	11,72%	70,05%
2007	40,21%	28,60%	71,81%
2008	(23,60%)	(4,91%)	(49,24%)
2009	43,84%	11,25%	113,43%
Average	20,34%	10,84%	43,95%

For the comparison with PEDMA strategy, in 2005, the PEDMA strategy resulted in 7,56 % profit to the investors but using Buy and Hold strategy, the profit is almost doubled which is over 13%. The following year the profit from PEDMA strategy increased to 11,72% while the return from Buy and Hold strategy was over 70%. In 2007, the return from PEDMA increased sharply to 28,60% , while the profit from buy and hold strategy also increased to 71,81%. In the year of crisis, year 2008, using Buy and Hold strategy gave a huge loss almost 50% , while using PEDMA strategy, the loss can be minimalized to only 4,91%. In the following year, 2009, the profit from Buy and Hold strategy get back on the track which gave returns around 113,43%, in a meantime, the profit from PEDMA just around 11%.

The price of all stocks is keep increasing after 2005 because of some factors such as the indonesia economy growth is increasing and the period of bullish market. This condition makes the strategy of low pe and combination of pe&dma cannot beat the Buy and Hold strategy sincethe buying parameter of both strategy requires PE to fall below 5 years average PE and once the investor sell the stock, its difficult to get back in.

In year 2005, generally, Buy and Hold strategy gave a higher return. However, the performance of some stocks in that year is quite flat resulting in a dramatic outperformance of other strategies (PE and PEDMA) over Buy and Hold strategy. Because of this dramatic outperformance, it skewed the overall average result on the stocks covered in this study. Thus, PE and PEDMA strategy beat Buy and Hold strategy for this reason.

There is a special case in 2008 which the PE and PEDMA can beat the Buy and Hold strategy significantly. Using these tow strategies, the loss can be minimalized compare if using Buy and Hold strategy because in this year, the price of the stocks was falling sharply due to some factors such as subprime mortgage, Madoc fraud, that make many big company in the world was suffering losses and some was bankrucpt. These has an impact to the indonesian economy too which make almost all company was suffering a big loss that make the stock was decreasing sharply.

Hypothesis Testing

This research want to analyze the three strategy which can give the biggest return to the investor. The t- test will be performed to know the result

Hypothesis 1

Ho : there is no significance difference in return between PE and B&H

H_1 : there is a significance difference in return between PE and B&H

2005	2006	2007	2008	2009
0,21543	5,68E-05	0,01638	2,31E-05	0,00019

From 2005 to 2009, only in 2005 that the Ho cannot be rejected since the P-value is bigger than 0,05. From 2006 to 2009, there is strong evidence to infer that the Ho is rejected since the P-value after divided by two, is smaller than 0,05.

Hypothesis 2

Ho : there is no significance difference in return between PEDMA and B&H

H_1 : there is a significance difference in return between PEDMA and B&H

2005	2006	2007	2008	2009
0,10774	7,56E-07	0,00289	3,11E-08	2,09E-06

From 2005 to 2009, only in 2005 that the Ho cannot be rejected since the P-value is bigger than 0,05. From 2006 to 2009, there is strong evidence to infer that the Ho is rejected since the P-value after divided by two, is smaller than 0.

CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

Conclussion

This research is conducted to know whether the low PE strategy or PEDMA strategy can give high returns that can beat Buy and Hold strategy. In this study, the author uses 28 companies that are listed in kompas100.

Many previous studies that are conducted in several countries prove that the low PE strategy can give significant returns to the investors. However, from the result of this study, although the low PE strategy can give postive returns to the investor but it cannot beat the buy and hold strategy.

The Buy and Hold strategy gives return that are significant if it is comparing to the PE and PEDMA strategy. The low PE strategy cannot be a good indicator if the market is in the bull condition. However, in some condition, for example in 2008, where the world is in the crisis after subprime mortgage happened in USA, the Buy and Hold gives big negative returns since the price of the stocks was decreasing sharply. On the other hand, the PE and PEDMA strategy still can give a positive returns.

Limitations:

1. The time horizon should be more than 1 year because sometimes there is still no sell signal in that year, but in the test, the stock should be

sold in the end of the year to make year by year comparison

2. The company data, there are some companies which their data is hard to obtain. The company sometimes is not transparant a to the public so it is hard for investors to get the data.

Recommendation

- The PE alone cannot be the only parameter to generate buying or selling signal, there must have several parameters to strengthen the PE parameter.
- The parameter of the low PE can be adjusted for example the investor buy if the PE is 20% below 5 years average pe and sell the stock if the PE is 20% above 5 years average PE.
- The time horizon shoud be more than 1 year. So the result will be more accurate since the investor will follow the buy or sell order. The investor is not required to sell their stock in the end of the year althought there is still no sell signal.
- For further study, the sample can be changed to small caps company. So the investor will know whether which strategy is more profitable.

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APPENDICES

A. List of Some Samples Calculation

1. AALI

PE

2005		
Rp 10.000.000	Rp 3.075	3252,033
Rp 11.707.317	Rp 3.600	3252,033

2007		
Rp 11.707.317	Rp 12.250	955,6994
Rp 12.854.156	Rp 13.450	955,6994
Rp 12.854.156	Rp 13.050	984,9928
Rp 13.198.904	Rp 13.400	984,9928
Rp 13.198.904	Rp 16.800	785,649
Rp 15.477.286	Rp 19.700	785,649
Rp 15.477.286	Rp 18.700	827,6624
Rp 16.636.013	Rp 20.100	827,6624

2008		
Rp 16.636.013	Rp 27.000	616,1486
Rp 18.268.807	Rp 29.650	616,1486
Rp 18.268.807	Rp 26.000	702,6464
Rp 6.885.935	Rp 9.800	702,6464

2009		
Rp 6.885.935	Rp 11.750	586,037
Rp 8.526.839	Rp 14.550	586,037

[redacted]

PEDMA

2005		
Rp 10.000.000	Rp 3.075	3252,033
Rp 11.707.317	Rp 3.600	3252,033

2007		
Rp 11.707.317	Rp 16.800	696,8641
Rp 13.728.223	Rp 19.700	696,8641
Rp 13.728.223	Rp 18.700	734,1296
Rp 14.756.004	Rp 20.100	734,1296

2008		
Rp 14.756.004	Rp 27.000	546,5187
Rp 16.204.279	Rp 29.650	546,5187
Rp 16.204.279	Rp 26.000	623,2415

Rp 12.932.261	Rp 20.750	623,2415
Rp 12.932.261	Rp 23.000	562,2722
Rp 14.225.487	Rp 25.300	562,2722

2. ASII

PE

2005		
Rp 10.000.000	Rp 9.600	1041,667
Rp 10.468.750	Rp 10.050	1041,667
Rp 10.468.750	Rp 9.500	1101,974
Rp 11.680.921	Rp 10.600	1101,974
Rp 11.680.921	Rp 10.300	1134,07
Rp 12.021.142	Rp 10.600	1134,07
Rp 12.021.142	Rp 10.300	1167,101
Rp 11.904.432	Rp 10.200	1167,101

2006		
Rp 11.904.432	Rp 10.100	1178,657
Rp 12.022.298	Rp 10.200	1178,657
Rp 12.022.298	Rp 9.800	1226,765
Rp 12.513.004	Rp 10.200	1226,765
Rp 12.513.004	Rp 10.100	1238,911
Rp 13.070.514	Rp 10.550	1238,911
Rp 13.070.514	Rp 9.800	1333,726
Rp 13.604.004	Rp 10.200	1333,726
Rp 13.604.004	Rp 9.800	1388,164
Rp 13.534.596	Rp 9.750	1388,164

2008		
Rp 13.534.596	Rp 24.900	543,5581
Rp 14.078.154	Rp 25.900	543,5581
Rp 14.078.154	Rp 24.800	567,6675
Rp 14.447.138	Rp 25.450	567,6675
Rp 14.447.138	Rp 24.500	589,6791
Rp 14.918.881	Rp 25.300	589,6791
Rp 14.918.881	Rp 23.550	633,4981
Rp 6.683.405	Rp 10.550	633,4981

2009		
Rp 6.683.405	Rp 12.200	547,8201
Rp 9.860.762	Rp 18.000	547,8201
Rp 9.860.762	Rp 17.700	557,1052
Rp 10.334.301	Rp 18.550	557,1052

PEDMA

2008		
Rp 10.000.000	Rp 24.900	401,6064
Rp 10.401.606	Rp 25.900	401,6064

2009		
Rp 10.039.853	Rp 15.250	658,351
Rp 9.381.502	Rp 14.250	658,351

Rp 10.401.606	Rp 24.800	419,4196	Rp 9.381.502	Rp 15.450	607,2169
Rp 10.674.229	Rp 25.450	419,4196	Rp 8.895.728	Rp 14.650	607,2169
Rp 10.674.229	Rp 24.500	435,6828	Rp 8.895.728	Rp 15.250	583,3264
Rp 11.022.775	Rp 25.300	435,6828	Rp 10.499.876	Rp 18.000	583,3264
Rp 11.022.775	Rp 23.550	468,0584	Rp 10.499.876	Rp 17.700	593,2133
Rp 10.039.853	Rp 21.450	468,0584	Rp 11.004.107	Rp 18.550	593,2133

3. ANTM

PE

2005		
Rp 10.000.000	Rp 346	28901,73
Rp 13.583.815	Rp 470	28901,73
Rp 13.583.815	Rp 440	30872,31
Rp 14.509.984	Rp 470	30872,31
Rp 14.509.984	Rp 455	31890,08
Rp 14.669.435	Rp 460	31890,08
Rp 14.669.435	Rp 395	37137,81
Rp 15.969.258	Rp 430	37137,81
Rp 15.969.258	Rp 490	32590,32
Rp 16.295.161	Rp 500	32590,32

2007		
Rp 16.295.161	Rp 1.560	10445,62
Rp 16.817.442	Rp 1.610	10445,62
Rp 16.817.442	Rp 1.580	10643,95
Rp 17.243.200	Rp 1.620	10643,95
Rp 17.243.200	Rp 1.590	10844,78
Rp 19.086.813	Rp 1.760	10844,78
Rp 19.086.813	Rp 2.370	8053,507
Rp 22.871.961	Rp 2.840	8053,507
Rp 22.871.961	Rp 2.480	9222,565
Rp 24.532.023	Rp 2.660	9222,565
Rp 24.532.023	Rp 2.600	9435,393
Rp 24.909.438	Rp 2.640	9435,393
Rp 24.909.438	Rp 2.610	9543,846
Rp 25.386.631	Rp 2.660	9543,846
Rp 25.386.631	Rp 2.570	9878,066
Rp 25.386.631	Rp 2.570	9878,066
Rp 25.386.631	Rp 2.540	9994,737
Rp 25.786.420	Rp 2.580	9994,737
Rp 25.786.420	Rp 2.400	10744,34
Rp 27.666.680	Rp 2.575	10744,34
Rp 27.666.680	Rp 2.525	10957,1
Rp 29.036.318	Rp 2.650	10957,1
Rp 29.036.318	Rp 2.775	10463,54

2008		
Rp 39.122.732	Rp 3.700	10573,71
Rp 41.237.475	Rp 3.900	10573,71
Rp 41.237.475	Rp 3.550	11616,19
Rp 44.722.332	Rp 3.850	11616,19
Rp 44.722.332	Rp 3.600	12422,87
Rp 41.616.614	Rp 3.350	12422,87
Rp 41.616.614	Rp 3.225	12904,38
Rp 44.842.708	Rp 3.475	12904,38
Rp 44.842.708	Rp 3.225	13904,72
Rp 46.580.798	Rp 3.350	13904,72

Rp 46.580.798	Rp 3.325	14009,26
Rp 47.281.261	Rp 3.375	14009,26
Rp 47.281.261	Rp 3.300	14327,65
Rp 15.617.144	Rp 1.090	14327,65

Rp 35.837.617	Rp 3.425	10463,54
Rp 35.837.617	Rp 3.000	11945,87
Rp 39.122.732	Rp 3.275	11945,87

2009		
Rp 15.617.144	Rp 1.230	12696,86
Rp 15.617.144	Rp 1.230	12696,86
Rp 15.617.144	Rp 1.180	13234,87
Rp 16.278.887	Rp 1.230	13234,87
Rp 16.278.887	Rp 1.160	14033,52
Rp 17.541.904	Rp 1.250	14033,52
Rp 17.541.904	Rp 1.150	15253,83
Rp 18.762.211	Rp 1.230	15253,83
Rp 18.762.211	Rp 1.200	15635,18
Rp 17.042.341	Rp 1.090	15635,18

ANTM

PEDMA

2005		
Rp 10.000.000	Rp 346	28901,73
Rp 13.583.815	Rp 470	28901,73
Rp 13.583.815	Rp 440	30872,31
Rp 14.509.984	Rp 470	30872,31
Rp 14.509.984	Rp 455	31890,08
Rp 14.669.435	Rp 460	31890,08
Rp 14.669.435	Rp 490	29937,62
Rp 14.968.811	Rp 500	29937,62

2007		
Rp 14.968.811	Rp 1.560	9595,392
Rp 15.448.580	Rp 1.610	9595,392
Rp 15.448.580	Rp 1.580	9777,583
Rp 15.839.684	Rp 1.620	9777,583
Rp 15.839.684	Rp 1.590	9962,065
Rp 17.533.235	Rp 1.760	9962,065
Rp 17.533.235	Rp 2.370	7397,989
Rp 21.010.290	Rp 2.840	7397,989
Rp 21.010.290	Rp 2.480	8471,891
Rp 22.535.230	Rp 2.660	8471,891
Rp 22.535.230	Rp 2.600	8667,396
Rp 22.881.926	Rp 2.640	8667,396
Rp 22.881.926	Rp 2.610	8767,021

2008		
Rp 31.727.579	Rp 3.700	8575,021
Rp 25.081.938	Rp 2.925	8575,021

Rp 25.081.938	Rp 3.375	7431,685
Rp 28.983.572	Rp 3.900	7431,685
Rp 28.983.572	Rp 3.550	8164,387
Rp 31.432.888	Rp 3.850	8164,387
Rp 31.432.888	Rp 3.600	8731,358
Rp 28.595.197	Rp 3.275	8731,358
Rp 28.595.197	Rp 3.425	8348,963
Rp 27.969.025	Rp 3.350	8348,963

Rp 23.320.277	Rp 2.660	8767,021
Rp 23.320.277	Rp 2.570	9074,038
Rp 23.320.277	Rp 2.570	9074,038
Rp 23.320.277	Rp 2.540	9181,211
Rp 23.687.526	Rp 2.580	9181,211
Rp 23.687.526	Rp 2.400	9869,802
Rp 25.414.741	Rp 2.575	9869,802
Rp 25.414.741	Rp 2.525	10065,24
Rp 21.137.012	Rp 2.100	10065,24
Rp 21.137.012	Rp 2.250	9394,228
Rp 20.667.301	Rp 2.200	9394,228
Rp 20.667.301	Rp 2.250	9185,467
Rp 20.437.664	Rp 2.225	9185,467
Rp 20.437.664	Rp 2.300	8885,941
Rp 23.547.744	Rp 2.650	8885,941
Rp 23.547.744	Rp 2.775	8485,673
Rp 29.063.431	Rp 3.425	8485,673
Rp 29.063.431	Rp 3.000	9687,81
Rp 31.727.579	Rp 3.275	9687,81

4. BBCA

PE

2005		
Rp 10.000.000	Rp 1.613	6199,628
Rp 10.229.386	Rp 1.650	6199,628

2006		
Rp 10.229.386	Rp 1.700	6017,286
Rp 11.059.772	Rp 1.838	6017,286
Rp 11.059.772	Rp 1.750	6319,87
Rp 11.457.923	Rp 1.813	6319,87
Rp 11.457.923	Rp 1.775	6455,168
Rp 11.619.303	Rp 1.800	6455,168
Rp 11.619.303	Rp 1.913	6073,864
Rp 11.771.149	Rp 1.938	6073,864
Rp 11.771.149	Rp 1.988	5921,101
Rp 11.919.177	Rp 2.013	5921,101
Rp 11.919.177	Rp 1.975	6035,026

2008		
Rp 12.220.928	Rp 2.975	4107,875
Rp 13.145.200	Rp 3.200	4107,875
Rp 13.145.200	Rp 3.100	4240,387
Rp 13.675.248	Rp 3.225	4240,387
Rp 13.675.248	Rp 2.900	4715,603
Rp 14.854.149	Rp 3.150	4715,603

Rp 14.854.149	Rp 3.000	4951,383
Rp 15.596.857	Rp 3.150	4951,383
Rp 15.596.857	Rp 3.125	4990,994
Rp 15.846.406	Rp 3.175	4990,994
Rp 15.846.406	Rp 3.125	5070,85
Rp 16.480.263	Rp 3.250	5070,85
Rp 16.480.263	Rp 3.025	5448,021
Rp 17.706.067	Rp 3.250	5448,021
Rp 17.706.067	Rp 3.150	5620,974
Rp 17.987.116	Rp 3.200	5620,974
Rp 17.987.116	Rp 3.175	5665,233
Rp 18.412.008	Rp 3.250	5665,233

Rp 12.220.928	Rp 2.025	6035,026

2009		
Rp 18.412.008	Rp 3.500	5260,574
Rp 19.595.638	Rp 3.725	5260,574
Rp 19.595.638	Rp 3.575	5481,297
Rp 20.006.735	Rp 3.650	5481,297
Rp 20.006.735	Rp 3.575	5596,289
Rp 20.426.457	Rp 3.650	5596,289
Rp 20.426.457	Rp 3.550	5753,931
Rp 21.433.394	Rp 3.725	5753,931
Rp 21.433.394	Rp 3.625	5912,661
Rp 22.024.661	Rp 3.725	5912,661
Rp 22.024.661	Rp 3.600	6117,961
Rp 22.636.457	Rp 3.700	6117,961

BBCA

PEDMA

2006		
Rp 10.000.000	Rp 1.738	5753,74
Rp 10.575.374	Rp 1.838	5753,74
Rp 10.575.374	Rp 1.750	6043,071
Rp 10.956.087	Rp 1.813	6043,071
Rp 10.956.087	Rp 1.775	6172,444
Rp 11.110.399	Rp 1.800	6172,444
Rp 11.110.399	Rp 1.913	5807,84
Rp 11.255.595	Rp 1.938	5807,84
Rp 11.255.595	Rp 1.988	5661,768
Rp 11.397.139	Rp 2.013	5661,768
Rp 11.397.139	Rp 1.975	5770,703
Rp 11.685.674	Rp 2.025	5770,703

2008		
Rp 11.685.674	Rp 3.175	3680,527
Rp 11.961.713	Rp 3.250	3680,527
Rp 11.961.713	Rp 3.175	3767,469
Rp 12.244.274	Rp 3.250	3767,469
Rp 12.244.274	Rp 3.150	3887,071
Rp 12.438.627	Rp 3.200	3887,071
Rp 12.438.627	Rp 3.175	3917,678
Rp 11.948.917	Rp 3.050	3917,678
Rp 11.948.917	Rp 3.175	3763,439
Rp 11.478.488	Rp 3.050	3763,439
Rp 11.478.488	Rp 2.975	3858,315
Rp 11.285.572	Rp 2.925	3858,315
Rp 11.285.572	Rp 2.975	3793,47
Rp 10.526.878	Rp 2.775	3793,47
Rp 10.526.878	Rp 3.150	3341,866
Rp 10.861.065	Rp 3.250	3341,866

2009		
Rp 10.861.065	Rp 3.500	3103,161
Rp 8.611.273	Rp 2.775	3103,161
Rp 8.611.273	Rp 2.975	2894,545
Rp 7.960.000	Rp 2.750	2894,545
Rp 7.960.000	Rp 2.825	2817,699
Rp 7.889.557	Rp 2.800	2817,699
Rp 7.889.557	Rp 2.925	2697,285
Rp 10.047.385	Rp 3.725	2697,285
Rp 10.047.385	Rp 3.575	2810,457
Rp 10.258.169	Rp 3.650	2810,457
Rp 10.258.169	Rp 3.575	2869,418
Rp 10.473.376	Rp 3.650	2869,418
Rp 10.473.376	Rp 3.550	2950,247
Rp 10.989.669	Rp 3.725	2950,247
Rp 10.989.669	Rp 3.625	3031,633
Rp 11.292.832	Rp 3.725	3031,633
Rp 11.292.832	Rp 3.600	3136,898
Rp 11.606.522	Rp 3.700	3136,898

5. BUMI

PE

2005		
Rp 10.000.000	Rp 780	12820,51
Rp 9.743.590	Rp 760	12820,51

2006		
Rp 9.743.590	Rp 760	12820,51
Rp 9.743.590	Rp 760	12820,51
Rp 9.743.590	Rp 740	13167,01
Rp 10.138.600	Rp 770	13167,01
Rp 10.138.600	Rp 760	13340,26
Rp 10.272.003	Rp 770	13340,26
Rp 10.272.003	Rp 760	13515,79
Rp 10.407.161	Rp 770	13515,79

2007		
Rp 10.407.161	Rp 910	11436,44
Rp 19.441.949	Rp 1.700	11436,44
Rp 19.441.949	Rp 1.590	12227,64
Rp 20.786.989	Rp 1.700	12227,64
Rp 20.786.989	Rp 2.275	9137,138
Rp 37.462.266	Rp 4.100	9137,138

2008

2009		
Rp 12.849.057	Rp 940	13669,21
Rp 44.083.200	Rp 3.225	13669,21
Rp 37.462.266	Rp 3.275	11438,86
Rp 45.183.496	Rp 3.950	11438,86
Rp 45.183.496	Rp 3.200	14119,84
Rp 12.849.057	Rp 910	14119,84

PEDMA

2005		
Rp 10.000.000	Rp 780	12820,51
Rp 9.358.974	Rp 730	12820,51
Rp 9.358.974	Rp 780	11998,69
Rp 9.119.001	Rp 760	11998,69
Rp 9.119.001	Rp 770	11842,86
Rp 9.000.572	Rp 760	11842,86
Rp 9.000.572	Rp 780	11539,19
Rp 9.462.140	Rp 820	11539,19
Rp 9.462.140	Rp 830	11400,17
Rp 9.348.138	Rp 820	11400,17
Rp 9.348.138	Rp 830	11262,82
Rp 9.235.510	Rp 820	11262,82
Rp 9.235.510	Rp 840	10994,65
Rp 9.015.617	Rp 820	10994,65
Rp 9.015.617	Rp 830	10862,19
Rp 9.015.617	Rp 830	10862,19
Rp 9.015.617	Rp 850	10606,61
Rp 8.803.485	Rp 830	10606,61
Rp 8.803.485	Rp 850	10357,04
Rp 8.492.774	Rp 820	10357,04

2007		
Rp 8.492.774	Rp 910	9332,718
Rp 15.865.621	Rp 1.700	9332,718
Rp 15.865.621	Rp 1.590	9978,378
Rp 16.963.242	Rp 1.700	9978,378
Rp 16.963.242	Rp 2.275	7456,37
Rp 30.571.118	Rp 4.100	7456,37

2009		
Rp 30.571.118	Rp 2.250	13587,16
Rp 28.533.044	Rp 2.100	13587,16
Rp 28.533.044	Rp 1.900	15017,39
Rp 48.431.087	Rp 3.225	15017,39

B. Buy and Hold

AALI	
Date	Price
03/01/2005	3075
29/12/2005	4900
02/01/2006	5050
28/12/2006	12600
02/01/2007	12800
28/12/2007	28000
02/01/2008	28350

ASII	
Date	Price
03/01/2005	9600
29/12/2005	10200
02/01/2006	10100
28/12/2006	15700
02/01/2007	16350
28/12/2007	27300
02/01/2008	26600

ANTM	
Date	Price
03/01/2005	346
29/12/2005	715
02/01/2006	720
28/12/2006	1600
02/01/2007	1620
28/12/2007	4475
02/01/2008	4425

30/12/2008	9800
05/01/2009	11750
30/12/2009	22750

30/12/2008	10550
05/01/2009	12200
30/12/2009	34700

30/12/2008	1090
05/01/2009	1230
30/12/2009	2200

BBCA	
Date	Price
03/01/2005	1475
29/12/2005	1700
02/01/2006	1700
28/12/2006	2600
02/01/2007	2625
28/12/2007	3650
02/01/2008	3625
30/12/2008	3250
05/01/2009	3500
30/12/2009	4850

BUMI	
Date	Price
03/01/2005	780
29/12/2005	760
02/01/2006	760
28/12/2006	900
02/01/2007	910
28/12/2007	6000
02/01/2008	6000
30/12/2008	910
05/01/2009	940
30/12/2009	2425

C. Paired-Samples t Test

PE

2005

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,180174	0,13697
Variance	0,050512	0,116401
Observations	28	28
Pearson Correlation	0,555482	
Hypothesized Mean Difference	0	
df	27	
t Stat	0,799688	
P(T<=t) one-tail	0,215436	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,430872	
t Critical two-tail	2,05183	

2006

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,232273	0,700478
Variance	0,145599	0,215067
Observations	28	28
Pearson Correlation	0,166345	
Hypothesized Mean Difference	0	
df	27	
t Stat	-4,50982	
P(T<=t) one-tail	5,68E-05	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,000114	
t Critical two-tail	2,05183	

2007

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,402126	0,718141
Variance	0,392266	1,666517
Observations	28	28
Pearson Correlation	0,931716	
Hypothesized Mean Difference	0	
df	27	
t Stat	-2,2504	
P(T<=t) one-tail	0,016387	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,032774	
t Critical two-tail	2,05183	

2008

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	-0,236	-0,49241
Variance	0,138044	0,080772
Observations	28	28
Pearson Correlation	0,664658	
Hypothesized Mean Difference	0	
df	27	
t Stat	4,8443	
P(T<=t) one-tail	2,31E-05	
t Critical one-tail	1,703288	
P(T<=t) two-tail	4,63E-05	
t Critical two-tail	2,05183	

2009

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,438391	1,134306
Variance	0,33016	1,123116
Observations	28	28
Pearson Correlation	0,511759	
Hypothesized Mean Difference	0	
df	27	
t Stat	-4,04196	
P(T<=t) one-tail	0,000198	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,000396	
t Critical two-tail	2,05183	

PEDMA vs B&H

2005

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,075634	0,13697
Variance	0,026459	0,116401
Observations	28	28
Pearson Correlation	0,6972	
Hypothesized Mean Difference	0	
df	27	
t Stat	-1,2684	
P(T<=t) one-tail	0,107742	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,215483	
t Critical two-tail	2,05183	

2006

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,117227	0,700478
Variance	0,074819	0,215067
Observations	28	28
Pearson Correlation	0,14268	
Hypothesized Mean Difference	0	
df	27	
t Stat	-6,12752	
P(T<=t) one-tail	7,56E-07	
t Critical one-tail	1,703288	
P(T<=t) two-tail	1,51E-06	
t Critical two-tail	2,05183	

2007

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,285995	0,718141
Variance	0,351273	1,666517
Observations	28	28
Pearson Correlation	0,938107	
Hypothesized Mean Difference	0	
df	27	
t Stat	-2,99673	
P(T<=t) one-tail	0,002896	
t Critical one-tail	1,703288	
P(T<=t) two-tail	0,005792	
t Critical two-tail	2,05183	

2008

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	-0,04912	-0,49241
Variance	0,012038	0,080772
Observations	28	28
Pearson Correlation	-0,13435	
Hypothesized Mean Difference	0	
df	27	
t Stat	7,374035	
P(T<=t) one-tail	3,11E-08	
t Critical one-tail	1,703288	
P(T<=t) two-tail	6,23E-08	
t Critical two-tail	2,05183	

2009

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	0,112474	1,134306
Variance	0,046795	1,123116
Observations	28	28
Pearson Correlation	0,61835	
Hypothesized Mean Difference	0	
df	27	
t Stat	-5,74308	
P(T<=t) one-tail	2,09E-06	
t Critical one-tail	1,703288	
P(T<=t) two-tail	4,17E-06	
t Critical two-tail	2,05183	

D. SAMPLES

List of Samples	
1	AALI
2	ASII
3	ANTM
4	BBCA
5	BBNI
6	BDMN
7	BLTA
8	BUMI
9	GGRM
10	INCO
11	INDF
12	INTP
13	ISAT
14	KLBF
15	MEDC

16	SMGR
17	TINS
18	TLKM
19	UNTR
20	UNVR
21	RALS
22	MYOR
23	SMRA
24	CTRS
5	CMNP
26	PNBN
27	BNII
28	BNGA